

# Bees and Pollinators: A Commonwealth Concern

A report to the Commonwealth  
Heads of Government and Civil Society  
**CHOGM Malta 2015**



Pollination is natural resilience at its best.

Action for bees and pollinators underpins Commonwealth concerns about resilience, food security, biodiversity and functioning natural ecosystems.

The Commonwealth, its member nations and organisations can be at the forefront of action to reverse bee and pollinator decline.

**Bees and Pollinators: A Commonwealth Concern** shows how the Commonwealth can start leading action to secure a vibrant, healthy future for our pollinators.

*“The Commonwealth depends on these unsung pollinating heroes to help ensure plenty of good quality food is available, our economies prosper and our wildlife thrives.”*

*Professor Simon Potts, Co-Chair, ‘Pollinators, Pollination and Food Production’ assessment  
UN Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)*

# Bees and Pollinators: A Commonwealth Concern

Commonwealth leaders, nations and organisations are rightly addressing their role in food security, poverty reduction and climate change including at the Malta Commonwealth Heads of Government Meeting (CHOGM 2015).

However the aims and efforts of Commonwealth leaders and civil society organisations will be hindered if the effective natural pollination of plants and crops by bees and other pollinating insects and creatures are not protected as evidence now shows the populations are in decline

CHOGM could be the start of Commonwealth nation's leading the way to reverse the decline of our bees and pollinators including implementing the Sustainable Development Goals that will protect and restore biodiversity and ecosystems and act on climate change, both in urban and city areas and rural and agricultural countryside.

Resilience	Over 87% of plant species are pollinated by bees and other creatures which humans use for food, medicine and materials and to feed livestock. <sup>2</sup>
Food security	Production of 70% of the 124 world's main crops depends on pollination by bees and other beneficial insects. <sup>3,4</sup>
Economies	The annual economic value of wild and managed pollination was estimated at €153 bn in 2005 (equivalent to US\$164 bn). <sup>5</sup>

Bees and Pollinators: A Commonwealth Concern, shows the way with recommendations for innovative policy and partnerships including for crop production and urban pollinators.

## A world without bees? Unimaginable!

Our lives would be poorer in many ways in a world without bees. We take bees and other pollinating creatures for granted at our peril. They are vital for a resilient, thriving natural environment and for stable, healthy food supplies including the varied, colourful and nutritious diets we have come to expect.

*"A decline in pollinator abundance and diversity can result in a loss of pollination services that could significantly affect the maintenance of wild plant diversity, wider ecosystem stability, crop production, food security, and human welfare."*

Global trends in the status of bird and mammal pollinators, Regan et al (2015)<sup>1</sup>

As well as bees (Hymenoptera) pollination is performed by other beneficial insects especially moths and hoverflies and to some extent by beetles, wasps, flies and butterflies. Some mammals, especially bats, also pollinate ecologically and economically important plants such as agave and cacti.<sup>6</sup>

Several bird groups are important pollinators for example sunbirds and spiderhunters (Nectariniidae) in Africa, honey-eaters (Meliphagidae) in Australasia and the Pacific Islands, and hummingbirds (Trochilidae) in the Americas<sup>7</sup> and some reptiles have been shown to be effective pollinators.<sup>8</sup>

*"Pollinators are a key component of global biodiversity, providing vital ecosystem services to crops and wild plants. There is clear evidence*

*of recent declines in both wild and domesticated pollinators, and parallel declines in the plants that rely upon them."*

Global pollinator declines: trends, impacts and drivers, Potts et al (2010)<sup>2</sup>

### Pollinators in peril

The growing evidence is that bees and pollinators are declining in many regions of the world.

The causes and drivers of decline are mainly a combination of:

- > Damage to and loss of natural habitats, caused by insensitive development and the growth of intensive agriculture;
- > Effects of climate change;
- > The spread of pathogens and invasive alien species; and,
- > Hunting.

The plight of pollinators is so important that the first report of the new Intergovernmental Platform on Biodiversity and Ecosystem Security (IPBES) is to be devoted to pollinators. The IPBES report on Pollinators, pollination and food production<sup>9</sup> will address:

- > The role of native and exotic pollinators
- > The status of and trends in pollinators and pollination networks and services
- > Drivers of change

*"There is mounting evidence of pollinator decline all over the world and consequences in many agricultural areas could be significant."*

*Economic valuation of the vulnerability of world agriculture confronted with pollinator decline, Gallai et al (2009)<sup>5</sup>*

- > Impacts on human well-being and food production of pollination decline and deficits
- > The effectiveness of responses to pollination declines and deficits

*“...the potential impact of pollinator decline on global health and nutrition is difficult to estimate. Any impact is likely to be more dramatic in developing countries, which are already vulnerable to food and nutrient shortages related to demographic and climate change.”*

Contribution of pollinator-mediated crops to nutrients in the human food supply, Eilers et al (2011)<sup>4</sup>

## Benefits for biodiversity

Nearly 90% of plant species are pollinated by animals<sup>10</sup> and so the health of natural ‘ecosystems’ is fundamentally linked to the health of our pollinators. The fruits and seeds which result from animal pollination are important sources of food for many mammals, birds, reptiles and insects.

## Food security

At least three quarters of the world’s crops benefit from animal pollination.<sup>11</sup> These crops produce bigger and higher quality yields when healthy pollinator communities are present.

Many pollinator dependent crops, (e.g. many of our fruits, vegetable and nuts) are packed full of vitamins and minerals which are essential for healthy human diets.<sup>12</sup>



Commonwealth country	Examples of crops depending on natural pollination
Australia	Macadamia nuts, Sunflower seeds
Cameroon	Cocoa, Coffee
Canada	Canola, Blueberries
Cyprus	Almonds, Melons
England	Strawberries, Apples, Beans, Oil-seed
Ghana	Cocoa, Beans
Grenada	Nutmeg, Cocoa
India	Eggplant, Tomatoes
Kenya	Passionfruit, Coffee, Watermelons, Runner beans
Lesotho	Beans
Malawi	Groundnuts, Macadamia nuts
Malta	Tomatoes, Green pepper
Mauritius	Tomatoes, Coconut
Mozambique	Cashew nuts, Mango
Namibia	Ground nuts, Alfalfa
New Zealand	Kiwi fruits, Apples
Nigeria	Papaya, Cashew
Pakistan	Mangoes, Cardamoms
Papua New Guinea	Coffee, Vanilla, Cardamoms
Rwanda	Coffee, Beans
Scotland	Raspberries, Oil-seed
Sri Lanka	Coconut, spices
Tanzania	Cashew nuts, Coffee
Uganda	Coffee, Beans
Zambia	Peanuts, Sunflower seed

It is also often overlooked that even some of the feed grown for livestock (e.g. clover, alfalfa) depend, at least in part, on animal pollination. As well as ensuring that we have enough good quality food pollinators add variety and flavour as most of our herbs (e.g. coriander, mint, basil) and spices (chilli, cardamom) also need pollinators.



## National Economies

The livelihoods of many millions of people are closely linked to pollinators. Pollinator dependent crops contribute to the income of farmers and there are also benefits to agri-food businesses using pollinator products as well as to the shops and markets which sell them.

Beekeeping is an important source of income in many rural areas around the world, where honey consumed locally and also traded and exported including as an ingredient in other food products, cosmetics and medicines.

## Social and cultural values

Pollinators also provide many less obvious benefits beyond food production. For instance, some biofuels, medicines, textiles (e.g. cotton) and construction materials come from animal pollinated plants. Pollinators are also important in arts and crafts, literature and music, and can inspire technology. There is bees wax used for candles and making fine violins, a sunbird is the national symbol of Singapore, a hummingbird of Jamaica, and a butterfly of Sri Lanka. People enjoy the tree and flower-filled landscapes of their countryside, of their gardens and parks; all of which depends on bees and other animal pollinators to maintain their diversity and their ability to keep flowering and growing.

## Pollinators: an urban issue

*“Managing urban areas has become one of the most important development challenges of the 21st century. Our success or failure in building sustainable cities will be a major factor in the success of the post-2015 UN development agenda.”* John Wilmoth, Director, UN Department of Economic and Social Affairs, Population Division

Today, 54 per cent of the world’s population lives in urban areas, a proportion that is expected to rise to 66 per cent by 2050<sup>14</sup>. This can impose huge pressures in urban landscapes for plants and animals, including pollinators, to coexist with humans.

UK research shows that urban areas can be surprisingly good for pollinating insects, with similar numbers of individuals and numbers of species found in urban areas compared with nature reserves and farms:

It is important to address the needs of pollinators in urban as well as rural areas for several reasons:

- > Urban food production is important in many countries and pollinators can provide an important pollination service for urban crops<sup>16</sup>
- > Wild flowers occur in urban areas as well as in rural landscapes so pollination is important for the long-term survival of these wild plant populations
- > Native pollinators are an intrinsic part of native biodiversity and provide an important service that benefits many animals as well as plants; pollination produces fruits and seeds that provide food for birds and mammals

- > Improving urban areas and habitat can aid the connectivity of high quality pollinator habitat across the wider landscape, help link urban areas to the rural hinterland and help support other objectives by contributing to the greening of urban areas and general improvement to the urban realm.

**SDG 11:** Make cities and human settlements inclusive, safe, resilient and sustainable

## Urban planning and participatory governance

*“The management of pollinator diversity involves many stakeholders and often implies transfers of costs and benefits between stakeholder groups. It is therefore essential that mechanisms be developed not only to consult stakeholder groups, but also to facilitate their genuine participation in decision-making and in the sharing of benefits”.*

Convention on Biological Diversity (CBD) COP 6 Decision VI/5 (International initiative)<sup>17</sup>

Sustainable urban areas, when planned and managed properly, can “contribute to climate change mitigation efforts by lowering the ecological footprint associated with food production. At the same time, urban agriculture can enhance climate change adaptation efforts by increasing vegetation cover and reducing surface water run-off.”<sup>18</sup>

In Sri Lanka’s Western Province, Kesbewa’s city climate change and urban development strategies includes a pilot project to integrate urban and peri-urban agriculture for food, with the aim of increasing, “the supply of locally produced food and thus reduce their dependency on food imports, improving urban food security and generating income and job creation.”

43 acres of paddy field located in flood risk zones have now been put into cultivation. Households practising intensive home gardening are remarkably able to sell 53% more produce than before their training. Central to this process is the collaboration between local government, and local (planning) authorities to ensure inclusive participation and partnerships of different players and stakeholders from civil society.

There is a crucial role that participatory planning and design can play when local authorities and planners work directly with the communities and developers on land use and infrastructure proposals. Participation by civil society will ensure an inclusive process of all the different stakeholders, including women and youth, the poorest and most vulnerable.

Civil society partnerships between community organisations can mobilise those who have been marginalised and build on advocacy skills to lobby for new regulations and national pollinator strategies.



Top: Urban food growing Gardens, London.

Bottom: Urban farming, Kibera slums, Nairobi, Kenya – see back cover

*“The number of bee species found in UK urban areas was higher than in nearby agricultural sites, although our findings suggest that agricultural landscapes and nature reserves are important for other insect pollinators, particularly hoverflies and other flies.”*

Dr Katherine Baldock, Urban Pollinators Project, University of Bristol, UK<sup>15</sup>

## Technology, knowledge and citizen science

Involving many more people and organisations in action for pollinators can embrace technology and assist scientific study especially to improve evidence on pollinators, their role, condition, location and abundance.

Technology, knowledge transfer and the rise of 'citizen science' are combining to direct the best up to date information to everyone involved in acting for bees and pollinators, from scientific research and policy making to formal education and informal learning.

Online monitoring and identification tools such as iSpot<sup>19</sup> and citizen science exercises including via smart phone apps are increasingly popular. The Great British Bee Count, one of the UK's most popular annual bee monitoring events, uses a smart phone app to help people raise their knowledge and understanding about different bee species while gathering data to help build evidence.<sup>20</sup>

Such evidence is fundamental to producing well informed policies to help pollinators and to inform well directed practical activity from rural farming to urban planning. Engaging popular initiatives such as these empower civil society to play its part, raise its knowledge and even to contribute to the gathering of evidence and data, linking back to scientists and policy makers.

## Bees, Pollinators and SDGs

The Sustainable Development Goals (SDGs) are the targets and indicators that will be used by UN member states to frame their agendas and political policies over the next 15 years.

SDGs take the form of 17 goals, informed by 169 targets. For the first time a goal (SDG 15) specifically addresses biodiversity and ecosystems and threats to species such as bees and pollinators.

**SDG 15:** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**15.5** Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species

**15.9** By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

**15.a** Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems

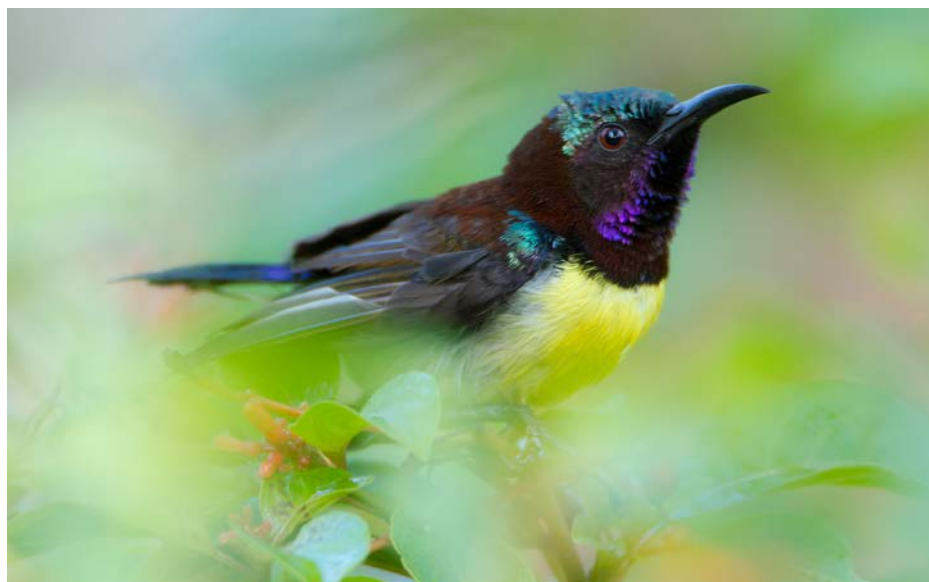
Climate change has its own dedicated SDG target and is integrated into most of the other goals. On careful reading many of the SDG targets reference the need to tackle climate change. For example the second goal on ending hunger contains

targets to ensure food production is able to adapt to climate change.

Bees and pollinators, themselves potentially vulnerable to the effects of climate change, will be the enablers integral to ensuring food production and security. Nevertheless, IIED's work on forests and the SDGs suggests that addressing terrestrial ecosystems through a single goal does not address the inter-relations between ecosystems and the other aspects within the SDG framework.

That is why IIED has proposed the application of a "modular approach" which aims to package together relevant targets and indicators from across all the SDGs through integrated implementation and integrated indicators. This is by far a more effective way of integrating the SDG goals and targets necessary to safeguard the biodiversity of bees and pollinators.

*The annual economic value of wild and managed pollination was estimated at €153 billion in 2005, (equivalent to US\$164 bn).<sup>13</sup>*



## Pollinators across the Commonwealth National case studies

### Australia

European honey bees (*Apis mellifera*) were introduced in 1822 and their ubiquity can obscure the need to conserve Australia's wild pollinator species. There are no native bumblebee species although non-native bumblebees have also been introduced. Instead, Australia has over 1,500 wild species of native bees, the majority of which are solitary bees and 10 of which are social stingless bees. Over 50 Australian crops depend on insect pollination according to the Ecological Society of Australia.

In 2014, the gross value of production (GVP) of the beekeeping industry in 2012-13 was determined as \$88 million, with a forecasted GVP of \$92

*"What makes the SDGs different is that there are also goals aimed at creating the conditions under which ending poverty, improving lives and protecting the planet are possible."*

*Tighe Geoghegan, Green Park Consultants Ltd and International Institute for Environment and Development (IIED)*

million in 2013-14, by the Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES). The relatively small beekeeping industry GVP probably understates the industry's value to agriculture and the economy in general through pollination services which have been estimated to contribute between \$620-1,730 million to the value of Australia's annual agricultural production.

A 2008 Inquiry into the Future Development of the Australian Honey Bee Industry led to the report, *More Than Honey: the future of the Australian honey bee and pollination industries*, from the Government Standing Committee on Primary Industries and Resources. The Government convened a workshop August 2008 into acting on the report's recommendations and to address key biosecurity risks affecting pollination-dependent industries. The Department of Agriculture, Fisheries and Forestry agreed to develop a strategy to support the development of viable business continuity options for honey producers and pollination-service providers, and the industries they support should parasitic *Varroa* mites spread in Australia.

## Canada

In 2009 the Natural Sciences and Engineering Research Council of Canada (NSERC) funded a 5-year national Canadian Pollination Initiative (CANPOLIN) on diverse aspects of pollinator research.<sup>21</sup>

Also in 2009, the Ontario Government implemented a ban on the use of pesticides for cosmetic applications across the province in response to concerns about their potential impacts on human health and wildlife.<sup>22</sup> Then, in 2015, the Ontario Government introduced new regulations to reduce usage and sale of neonicotinoid-treated seed in the province in recognition of significant concerns surrounding their impacts on bees and other beneficial insects. The regulations aim to achieve an 80% reduction in the usage of neonicotinoid-treated corn and soy bean seed from 2014 levels by 2017, and for insecticide usage to be targeted where substantial pest problems are demonstrated.<sup>23</sup>

In 2016 the Ontario Government will launch a comprehensive Pollinator Health Action Plan to help improve the health of both managed honey bees and wild insect pollinators.<sup>24</sup> Meanwhile, Professor Laurence Packer's group at York University, Toronto, and the Biodiversity Institute of Ontario / University of Guelph is leading the Bee Barcode of Life Initiative (Bee-BOL), an ambitious project to 'barcode' all of the world's 20,000 bee species.<sup>25</sup>

## Cyprus

Historically, Cyprus has been a haven for bees with 310 different species of wild bees, including some that are endemic, the Cyprus honey bee (*Apis mellifera cypria*) a Mediterranean sub-species of the European honey bee (*Apis mellifera*), and an historically wide diversity of plant species for bees to feed from.

However, as bee and pollinator declines have raised concerns about the supply of pollination services, especially for food and farming, a 2014 study into the amount of pollinated crop areas in 41 European countries identified a significant contraction (-39%) in the overall area of crops pollinated by honeybees in Cyprus, raising concern about the ability to cope should there be major losses of wild pollinators.<sup>26</sup>

## England

In November 2014, the UK Government launched its National Pollinator Strategy (NPS), a 10 year plan to reverse bee and pollinator decline in England, in response to high public and political concern about their decline and several public campaigns, including The Bee Cause, Friends of the Earth's bee campaign.

The Government announced its intention to draw up the NPS at the historic June 2013 Bee Summit hosted by Friends of the Earth, the National Federation of Women's Institutes (NFWI) and leading food retailers, Waitrose and The Cooperative. The Bee Summit was the first time that such a diverse group of interests keen to play their part in reversing bee decline had been convened - from government, community groups and businesses to scientists and researchers, farming and conservation groups.<sup>27</sup>

Friends of the Earth led a national steering group to guide early development of a draft NPS. With the publication of the NPS the group has been adopted by the Government to advise on implementing the NPS. Together the group is promoting action for pollinators by individuals, communities, businesses, land owners, farmers and others under the banner of Bees' Needs.<sup>28</sup>

The NPS aims for 'More, bigger, better, joined-up, diverse and high-quality flower-rich habitats (including nesting places and shelter) supporting our pollinators across the country', 'Healthy bees and other pollinators which are more resilient to climate change and severe weather events' and 'No further extinctions of known threatened pollinator species.'<sup>29</sup>

Scientific study and disseminating knowledge is essential to ensuring actions taken to aid bees and pollinators are well informed. In 2009 5 funding agencies and research institutions invested £10m over 5 years in the Insect Pollinators Initiative, a network of 9 innovative research projects aimed at understanding and mitigating the biological and environmental factors that adversely affect insect pollinators.<sup>30</sup>

## Ghana

Bees are essential for income and cashew pollination in Ghana. Integrating beekeeping with small-scale cashew farming delivers benefits for rural families from natural pollination increasing cashew yields and from sales of honey and beeswax. Honey bees (*Apis mellifera*) have been described by many pollination biologists as the most effective pollinator of cashew.<sup>31</sup>



*"The abundance and diversity of the right pollinators in the cashew agro-ecosystem gives Ghana a comparative advantage over other growing countries."*

*Kwame S Aidoo of the University of Cape Coast's Department of Entomology & Wildlife School of Biological Sciences.<sup>32</sup>*



However, studies supported by Bees for Development have identified several species of wild bees that are even more effective and important for pollination - two wild stingless bees (*Dactylurina staudingeri* and *Liotrigona parvula*) and seven wild solitary bees (*Brausapis* sp, *Ceratina* sp, *Compsomelissa* sp, *Halictus* sp, *Lasioglossum* sp, *Lipotriches* sp and *Thyreaus* sp) whose foraging activities indicate their effectiveness in the pollination of cashew flowers.

These two groups of wild bees are known to be heavy feeders of pollen and persistent foragers exhibiting behavioural characteristics which demonstrated their strong affinity to cashew flowers. The cashew plant's ability to produce large amounts of pollen is probably attractive to insects seeking pollen rather than foraging for nectar. These wild bees are therefore the most effective cashew pollinators in Ghana.

## Kenya

Pollinators of Kenyan crops and wild flowers include sunbirds, bushbabies, bats and a huge diversity of insects. Many crops are wholly dependent on pollinators, including passionfruit, cocoa, strawberries, eggplant, watermelon, cucumber, and pumpkin, whilst others, such as avocado, coffee, cowpeas, eggplant, mangoes, pigeon peas, pumpkins, okra, runner beans watermelons and tomatoes, all benefit from animal pollination.

Wild bees pollinate about two thirds of the vegetables and fruits grown in East Africa. Other insects are important too – about 4% of all the plants in Kenya, including papaya and many different African orchids, are pollinated by hawkmoths, and figs have a specialised pollination system which means they can only be pollinated by figwasps. Forage crops for livestock, including cattle and camels, are also reliant on animal pollination. Sunbirds are important for biodiversity – they pollinate giant lobelias that grow high on the mountains of East Africa, red hot poker trees and aloes.<sup>33</sup>

Animal pollination is crucially important for food production in Kenya. In the Baringo region of Kenya alone, watermelons worth KES 900 million (US \$9 million) are produced. All of these watermelons are the result of pollination by wild insects, primarily bees.<sup>33</sup>

Scientists based at the National Museums of Kenya have been studying pollinators and their importance for biodiversity and crop production. Along with the Insect Committee of Nature Kenya (also known as the East Africa Natural History Society) researchers have been working with farmers to raise awareness of the importance of pollination for crops and promote conservation of natural habitat. Kenyan-based scientists were also instrumental in establishing and promoting the African Pollinator Initiative.<sup>33</sup>

Kenyan researchers were recently involved in the GEF/UNEP/FAO Global Pollination Project

*“Conservation and Management of Pollinators for Sustainable Agriculture, through an Ecosystem Approach”* which also involved researchers in Ghana, South Africa, Nepal, India, Pakistan and Brazil.<sup>34</sup>

Dr Dino Martins has been educating farmers across Kenya on the negative effects of pesticides on pollinators which has led to reduced pesticide use and improved local income and food security due to increased crop yields. He has also been boosting awareness of pollinators and in 2014 produced a handbook of pollinator-friendly farming practices.<sup>35</sup>

Our Friends the Pollinators – A Handbook of Pollinator Diversity and Conservation in East Africa<sup>36</sup>, has been downloaded over 4,000 times and shared with 600,000 farmers on mobile phone platforms in Kenya.

Comments on the handbook by Cabinet Secretary for Environment, Water and Natural Resources, Professor Judi Wakhungu, capture the importance of bees and pollinators in East Africa:

*“East Africa depends on many different ecosystem services that come from nature for free. These include water resources, fertility of soil, energy from biomass, control of soil erosion, and pollination. To ensure we continue to have these vital services we need public awareness and education - two of the most important tools available for conservation and sustainable development.*

*“Global awareness about the crisis surrounding the conservation of biodiversity and environment has grown significantly. However, it is important to connect this global movement to local action, and the information presented in this book will enable farmers, teachers, and schoolchildren across East Africa to better understand, celebrate, and conserve pollinators in their farms and gardens.”*

*Resilience: Can we help bees to help us be resilient?*



## Malta

Beekeeping and honey production have a long history in Malta, with the most common etymology of the word 'Malta' being from the Greek word "meli" - meaning "honey". The Maltese honey bee is a distinct subspecies *Apis mellifera ruttneri* with different morphological characteristics from other Mediterranean bees. It is well adapted to the xeric conditions on the islands and to diseases.<sup>37</sup>

Malta's National Apiculture Programme (2014-16) recognises the importance of beekeeping in pollination services to maintain crop productivity and wild flora, and to the cultural identity of Malta, and aims to provide assistance to bee keepers to improve the production and marketing of their apiculture products.

Wild bees are also important in maintaining plant diversity, crop productivity and food security across the Maltese Archipelago which, though small, harbours a diverse array of habitats and plants, including a several species found nowhere else in the world. These endemic species have persisted throughout the Islands' long cultural history by agricultural settings providing important floral resources for wild bees.

## Papua New Guinea (PNG)

PNG's many wild pollinators such as the leaf

cutter bee *Megachile (Creightonella) frontalis* which pollinates coffee have existed for millennia before managed honey bees (*Apis mellifera*) were introduced to PNG after WWII as part of early interest in beekeeping and commercial honey production. Honeybees now exist in the bush in many areas of the country. Concern that an endemic *Varroa* mite species (*V. jacobsoni*) discovered in PNG in 2008 may be as harmful to managed honeybees as the *Varroa* destructor seen in many other parts of the world have prompted a study into the potential economic effects of *Varroa* on the pollination of PNG's main crops.<sup>38</sup>

## New Zealand

An agriculture-dependent economy New Zealand exports 80 per cent of the food it produces from apples and butter to lamb and kiwi fruit. Wild solitary native bees, other insects and some vertebrates assist pollination of wild plants and farm crops. But managed honey bees are the main pollinator of most commercial crops, including pasture legumes such as clover vital to lamb and dairy production.

Attention is increasing into how to prevent declines and restore the services provided by pollinators. Professor Jason Tylianakis of the

*"An agricultural economy like ours depends strongly on pollination, and between 60 and 75 per cent of all food crops require animal pollination... We need to manage our agriculture in a way that protects native bees and pollinating flies. We need to reduce the use of insecticides and provide some areas of unsprayed, uncultivated habitat with food and nesting sites in agricultural landscapes."*

*Professor Jason Tylianakis*





University of Canterbury is concerned that production of fruit, clover, canola and honey may suffer with bee decline.

Research has identified that New Zealand's dependence on managed honey bees increases vulnerability to the threats to managed honey bees: pests and diseases such as the varroa mite; the narrowing genetic base for breeding varroa-resistant bees; exposure to pesticides; and, the declining variety of floral resources bees seek for food.<sup>39</sup> A national list has been published of the best plants bees and pollinators seek for nutrition from abundant nectar and high quality pollen across the seasons to help bees feed and resist diseases, pests and exposure to pesticides – all part of improving pollinator resilience and security.

## Wales

The Welsh Government launched an Action Plan for Pollinators in June 2013 with a vision that “Wales supports healthy populations of wild and managed pollinators to benefit the people, economy and environment of Wales.”<sup>40</sup> The Plan states that, “... the reliance on pollinators to meet future food security needs is likely to increase, highlighting the importance of retaining pollination as a service.” Intensive land use and the loss and fragmentation of natural habitats in Wales are identified by the Plan as “a key reason for the decline of pollinators”. The Plan identifies priority actions and policies including for farming: “Improving conditions for pollinators throughout agricultural land is a key area for action, by providing more flowering plant species, and larger and better connected habitats.”



## Resources

### Global strategy and initiatives:

Sustainable Development Goals (SDGs)

[www.un.org/sustainabledevelopment/sustainable-development-goals/](http://www.un.org/sustainabledevelopment/sustainable-development-goals/)

UN General Assembly - Transforming our world: the 2030 Agenda for Sustainable Development

[www.un.org/ga/search/view\\_doc.asp?symbol=A/70/L.1&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/70/L.1&Lang=E)

Convention on Biological Diversity (CBD) and Pollination [www.cbd.int/agro/pollinator.shtml](http://www.cbd.int/agro/pollinator.shtml)

FAO's Global Action on Pollination Services for Sustainable Agriculture <http://www.fao.org/pollination/en/>

FAO's Pollinators Database [www.fao.org/pollination/pollination-database/en/](http://www.fao.org/pollination/pollination-database/en/)

OECD Managing Pesticide Risk to Insect Pollinators [www.oecd.org/chemicalsafety/risk-mitigation-pollinators/](http://www.oecd.org/chemicalsafety/risk-mitigation-pollinators/)

### Pollinator Initiatives:

Global Pollination Project [www.pollinator.org/nappc/international.htm#FAO](http://www.pollinator.org/nappc/international.htm#FAO)

African Pollinator Initiative [www.pollinator.org/nappc/international.htm#africa](http://www.pollinator.org/nappc/international.htm#africa)

European Pollinator Initiative [www.pollinator.org/nappc/international.htm#europe](http://www.pollinator.org/nappc/international.htm#europe)

[www.europeanpollinatorinitiative.org/](http://www.europeanpollinatorinitiative.org/)

Oceania Pollinator Initiative [www.pollinator.org/nappc/international.htm#oceania](http://www.pollinator.org/nappc/international.htm#oceania)

UK Insect Pollinators Initiative (IPI) [www.nerc.ac.uk/research/funded/programmes/pollinators/](http://www.nerc.ac.uk/research/funded/programmes/pollinators/)

### National Pollinator Strategies / Action Plans:

England National Pollinator Strategy (NPS)

[www.gov.uk/government/publications/national-pollinator-strategy-for-bees-and-other-pollinators-in-england](http://www.gov.uk/government/publications/national-pollinator-strategy-for-bees-and-other-pollinators-in-england)

Welsh Action Plan for Pollinators [www.gov.wales/topics/environmentcountryside/consmanagement/conservationbiodiversity/action-plan-for-pollinators/?lang=en](http://www.gov.wales/topics/environmentcountryside/consmanagement/conservationbiodiversity/action-plan-for-pollinators/?lang=en)

### Practical advice:

Living with Environmental Change (LWEC) Policy and Practice Notes [www.nerc.ac.uk/research/partnerships/lwec/products/ppn/](http://www.nerc.ac.uk/research/partnerships/lwec/products/ppn/)

LWEC Policy and Practice Note on Managing urban areas for insect pollinators [www.nerc.ac.uk/research/partnerships/lwec/products/ppn/ppn20/](http://www.nerc.ac.uk/research/partnerships/lwec/products/ppn/ppn20/)

UK Urban Pollinators Project [www.urbanpollinators.org](http://www.urbanpollinators.org)  
Pollinator Safety in Agriculture: David Ward Roubik, Editor, United Nations (FAO) <http://www.fao.org/3/a-i3800e.pdf>

# Bees and Pollinators: A Commonwealth Call to Action

---

*Recommendations of aims, policies and actions are a starting point for all Commonwealth member states and organisations to start playing their part in this local to global challenge.*

## 1. Launch a National Bee Action Plan

Convene and build the capacity of stakeholders to help draw up a national strategy or action plan for bees and pollinators linked to biodiversity and climate change actions, food security and farming initiatives and rural and urban development plans.

## 2. Engage society in action

Develop and support action by civil society, businesses and scientists and researchers to play a full role in acting for pollinators based on evidence, emerging science and access to up to date information on the best actions to take.

## 3. Engage and build young people's role

Support young people's role in developing and delivering pollinator and resilience strategies, including:

- > Via the Commonwealth Youth Climate Change Network
- > By promoting urban and peri-urban agriculture youth led projects in food security and pollinator economies
- > By establishing youth-led citizen science to increase appropriate agriculture employment and participatory initiatives
- > By initiating a Youth Expert Group Meeting (EGM) on climate change impact on pollinators and food security.

## 4. Manage crop pollination

Develop actions and policies to address pollination as a food security issue.

## 5. Urban pollination

Develop particular actions and policies to support the abundance of pollinators in urban areas through land use planning and management, architecture, design and regeneration and development plans, including by:

- > Encouraging city climate change and urban development strategies to integrate urban pollination and peri-urban agriculture to support and increase urban food production and security.
- > Supporting and encouraging local authorities and urban planners to inform planning design codes in the provision of infrastructure including housing, highways, transport, public and private space, to identify habitats to be restored, reconnected and enhanced to provide both varied sources of food and shelter for pollinators.
- > Ensure that Local (planning) Authorities know which threatened pollinators occur in their area and which habitats are important to them, so that they can commission and check surveys to inform how pollinators have been considered in the planning process.

## 6. Support monitoring to inform decision and planning

Develop a pollinator indicator under the planned Biodiversity 2020 monitoring strategy, and establish a Commonwealth-wide standardised monitoring programme in urban and non-urban habitats to record pollinator populations and the success of conservation activities to help inform decision making.

## 7. Research, data gathering and knowledge transfer

Support and boost research and knowledge transfer to inform good policy and decision making and actions on bees, pollinators and approaches to conservation, farming and development, including by investing in university and other academic programmes to provide more pollinator experts and analysis.

## Commonwealth Organisations should:

### 8. Lead, support and build public engagement and partnerships

Support, encourage and initiate debate across civil society and between professions and disciplines to improve and exchange knowledge about, and action for bees and pollinators.



## 9. Integrate pollination to other priorities

Incorporate bees and pollinators to other discussions, research and projects such as food security and farming practice, urban planning and development, rural policies, conservation measures and learning and education.

## 10. Track global studies and their national application

The growing number of studies into pollinators and evidence of actions that help reverse their decline should be incorporated to Commonwealth considerations of issues such as resilience, climate and poverty.

## 11. Support and challenge each other

To lead and facilitate action to reverse bee and pollinator decline across the Commonwealth as part of work to implement the Sustainable Development Goals (SDGs) alongside other initiatives and priority programmes.

# References

[1] Regan et al (2015) Global trends in the status of bird and mammal pollinators. *Conservation Letters*. doi: 10.1111/conl.12162.

[2] Potts et al (2010) Global pollinator declines: trends, impacts and drivers. *Trends Ecology Evolution* 25, 345-353.

[3] Klein et al (2007) Importance of pollinators in changing landscapes for world crops. *Proceedings of the Royal Society B* 274, 303-313.

[4] Eilers et al (2011) Contribution of pollinator-mediated crops to nutrients in the human food supply. *PLoS ONE* 6(6): e21363.

[5] Gallai et al (2009) Economic valuation of the vulnerability of world agriculture confronted with pollinator decline. *Ecological Economics* 68, 810-821.

[6] Kunz et al (2011) Ecosystem services provided by bats. *Annals of the New York Academy of Sciences* 1223, 1-38.

[7] Cronk & Ojeda (2008) Bird-pollinated flowers in an evolutionary and molecular context. *Journal of Experimental Botany* 59, 715-727.

[8] Olesen & Valido (2003) Lizards as pollinators and seed dispersers: an island phenomenon. *Trends in Ecology and Evolution* 18, 177-181.

[9] IPBES, Pollinators, pollination and food production [www.ipbes.net/index.php/3-a-pollinators-and-pollination](http://www.ipbes.net/index.php/3-a-pollinators-and-pollination)

[10] Ollerton et al 2011, How many flowering plants are pollinated by animals? *Oikos* 120, 321-326.

[11] Klein et al (2007) Importance of pollinators in changing landscapes for world crops. *Proceedings of the Royal Society B* 274, 303-313.

[12] Chaplin-Kramer et al (2014) Global malnutrition overlaps with pollinator-dependent micronutrient production. *Proceedings of the Royal Society B* 281, 20141799.

[13] Gallai et al (2009) Economic valuation of the vulnerability of world agriculture confronted with pollinator decline. *Ecological Economics* 68, 810-821.

[14] UN DESA, 10 July 2014, New York

[15] Baldock et al (2015) Where is the UK's pollinator biodiversity? The importance of urban areas for flower-visiting insects. *Proceedings of the Royal Society B* 282, 20142849 [www.rspb.royalsocietypublishing.org/content/282/1803/20142849](http://www.rspb.royalsocietypublishing.org/content/282/1803/20142849)

[16] Matteson & Langellotto (2009) Direct and indirect effects of land use on floral resources and flower-visiting insects across an urban landscape. *Oikos* 122, 682-694.

[17] CBD, Retired sections: paragraphs 4-6, 14-15, 17 and 21 Agricultural biological diversity Element 3. Capacity-building [www.cbd.int/decision/cop/?id=7179](http://www.cbd.int/decision/cop/?id=7179)

[18] UN-Habitat Cities and Climate Change Initiative (CCCI), June 2014 e-Newsletter

[19] iSpot, The Open Science Laboratory and The Open University [www.ispotnature.org/communities/uk-and-ireland](http://www.ispotnature.org/communities/uk-and-ireland)

[20] Great British Bee Count, Friends of the Earth [www.foe.co.uk/page/great-british-bee-count-about](http://www.foe.co.uk/page/great-british-bee-count-about)

[21] Canadian Pollination Initiative (CANPOLIN) [www.uoguelph.ca/canpolin/](http://www.uoguelph.ca/canpolin/)

[22] Ontario pesticides restrictions [www.news.ontario.ca/ene/en/2009/03/ontarios-cosmetic-pesticides-ban.html](http://www.news.ontario.ca/ene/en/2009/03/ontarios-cosmetic-pesticides-ban.html)

[23] Ontario pesticides restrictions regulations [www.ontario.ca/page/neonicotinoid-regulations](http://www.ontario.ca/page/neonicotinoid-regulations)

[24] Ontario Pollinator Health Action Plan [www.omafra.gov.on.ca/english/pollinator/meeting-reg.htm](http://www.omafra.gov.on.ca/english/pollinator/meeting-reg.htm)

[25] Bee Barcode of Life initiative [www.barcodeoflife.org/content/community/projects](http://www.barcodeoflife.org/content/community/projects)

[26] Breeze TD, Vaissière BE, Bommarco R, Petanidou T, Seraphides N, Kozák L, et al. (2014) Agricultural Policies Exacerbate Honeybee Pollination Service Supply-Demand Mismatches Across Europe. *PLoS ONE* 9(1): e82996. doi:10.1371/journal.pone.0082996 [www.journals.plos.org/plosone/article?id=10.1371/journal.pone.0082996](http://www.journals.plos.org/plosone/article?id=10.1371/journal.pone.0082996)

[27] National Bee Summit, 2013 [www.foe.co.uk/resource/briefings/bee\\_summit\\_report.pdf](http://www.foe.co.uk/resource/briefings/bee_summit_report.pdf)

[28] Bees' Needs - National Pollinator Strategy for England [www.wildlifetrusts.org/bees-needs](http://www.wildlifetrusts.org/bees-needs)

[29] National Pollinator Strategy for England [www.gov.uk/government/publications/national-pollinator-strategy-for-bees-and-other-pollinators-in-england](http://www.gov.uk/government/publications/national-pollinator-strategy-for-bees-and-other-pollinators-in-england)

[30] Insect Pollinators Initiative [www.bbsrc.ac.uk/funding/opportunities/2009/insect-pollinators-initiative/](http://www.bbsrc.ac.uk/funding/opportunities/2009/insect-pollinators-initiative/) Biotechnology and Biological Sciences Research Council (BBSRC), Department for Environment, Food and Rural Affairs (Defra), Natural Environment Research Council (NERC), Scottish Government and Wellcome Trust

[31] Free & Williams, 1976; Heard et al, 1990

[32] Bees for Development, Boosting cashew production in Ghana [www.beesfordevelopment.org/what-we-do/information-and-education/info/file/1819-boosting-cashew-production-in-ghana?tmpl=component](http://www.beesfordevelopment.org/what-we-do/information-and-education/info/file/1819-boosting-cashew-production-in-ghana?tmpl=component)

[33] African Pollinator Initiative [www.arc.agric.za/arc-ppri/Pages/Biosystematics/African-Pollinator-Initiative-\(API\).aspx](http://www.arc.agric.za/arc-ppri/Pages/Biosystematics/African-Pollinator-Initiative-(API).aspx)

[34] GEF/UNEP/FAO Global Pollination Project [www.fao.org/agriculture/crops/thematic-sitemap/theme/spi/gppp/gppp-home/en/](http://www.fao.org/agriculture/crops/thematic-sitemap/theme/spi/gppp/gppp-home/en/)

[35] Whitley Fund for Nature Award 2009 [www.whitleyaward.org/winners/pollinators-and-people-in-kenya/](http://www.whitleyaward.org/winners/pollinators-and-people-in-kenya/)

[36] Dino J Martins, 2014, Nature Kenya, East Africa Natural History Society, National Museums of Kenya, Nairobi, Kenya UNEP, GEF-UNEP-FAO Kenya Pollination Project, Whitley Fund for Nature [www.discoverpollinators.org/pollinators/pollinator-handbook/](http://www.discoverpollinators.org/pollinators/pollinator-handbook/)

[37] Sheppard et al (1997) *Apis mellifera ruttneri*, a new honey bee subspecies from Malta. *Apidologie*, 28, 287-293.

[38] CSIRO Entomology, Australia with the National Agricultural Research Institute, Papua New Guinea and Rural Industries Research and Development Corporation, Australia [www.aciar.gov.au/project/ah/2008/037](http://www.aciar.gov.au/project/ah/2008/037)

[39] Pollination in New Zealand [www.landcareresearch.co.nz/\\_data/assets/.../2\\_11\\_Newstrom.pdf](http://www.landcareresearch.co.nz/_data/assets/.../2_11_Newstrom.pdf)

[40] Wales Action Plan for Pollinators [www.biodiversitywales.org.uk/Wales-Action-Plan-for-Pollinators](http://www.biodiversitywales.org.uk/Wales-Action-Plan-for-Pollinators)



Compiled and edited by **Jane Samuels** of The Commonwealth Human Ecology Council and **Paul de Zylva** of Friends of Earth.

**The Commonwealth Human Ecology Council (CHEC)**, founded in 1969, is an accredited Commonwealth organisation and a UK-registered international development charity committed to pursuing sustainable solutions for the preservation and use of the planet's natural resources. Through its focus on human ecology – the relationship between ecosystems and human societies – CHEC works to create lasting improvements for local communities across the Commonwealth.

[www.checinternational.org](http://www.checinternational.org)

**Friends of the Earth England Wales and Northern Ireland**, founded in 1971, campaigns for solutions to environmental problems as part of Friends of the Earth International, the world's largest grassroots environmental network operating in 75 nations. For more than 45 years we've seen that the wellbeing of people and planet go hand in hand - and it's been the inspiration for our campaigns. With thousands of people we've secured safer food and water, defended wildlife and natural habitats, championed the move to clean energy and acted to keep our climate stable.

[www.foe.co.uk](http://www.foe.co.uk)

**Kibera, Nairobi, Kenya:** Members of the Youth Reform Self Help Group tend their vegetable garden in the middle of Kibera slum. The young men were all previously involved in serious crime but have joined together to change their lives and Kibera. As well as growing vegetables they remove waste, coach football and boxing teams, and construct homes and toilets. Their desire to show change is possible means Kibera is a much safer place today.

**Jane and Paul wish to thank the following advisers and contributors for assistance in producing this report.**

**Dr Katherine Baldock**, NERC Knowledge Exchange Fellow, School of Biological Sciences & Cabot Institute, University of Bristol

**Dr Mario V Balzan**, Pollination and Ecosystem Services Researcher, Institute of Applied Sciences, Malta College of Arts, Science & Technology (MCAST)

**Dr Nicola Bradbear**, Director, Bees for Development; President, Apimondia Scientific Commission

**Simone Cutajar**, Friends of the Earth Malta

**Paul de Zylva**, Head of Nature, Friends of the Earth England Wales and Northern Ireland

**Dr Ian Douglas**, CHEC, Emeritus Professor School of Environment & Development, University of Manchester, Associate Editor (Urban Ecology) Landscape & Urban Planning President Council for Ecopolis Development Co-Chairman UNESCO Urban Futures Group

**Dr Wanja Kinuthia**, Co-ordinator, EAFRINET & UNEP/GEF/FAO: Kenya Pollination Project, Zoology Department, National Museums of Kenya

**Dr Dino Martins**, Director, Mpala Research Centre, Kenya and Chair, Insect Committee, Nature Kenya, The East Africa Natural History Society

**Professor Simon Potts**, Professor of Biodiversity and Ecosystem Services and Director, Centre for Agri-Environmental Research, School of Agriculture Policy and Development, University of Reading

**Professor Nigel Raine**, Rebanks Family Chair in Pollinator Conservation, School of Environmental Sciences, University of Guelph

**Jane Samuels**, CHEC, Governing Board and Chair of Bees & Pollinators Steering Group, Commonwealth Human Ecology Council

**Caryll Stephen**, Chair, Commonwealth Human Ecology Council, Chief Executive of the Foundation for Water Research (FWR)

**Raf Tuts**, Chief Urban Environment & Planning Branch, United Nations Human Settlements Programme, UN-HABITAT Nairobi, Kenya



Commonwealth Human Ecology Council

